

100 tífiques

workshop to prepare the talk

January 2022

100 tífiques

#100tífiques 2022

Who are the 100tífiques in 2022?

- 449 researchers (321 public and 128 private)
- 57 internationals working in Catalonia
- 12 Catalan/International researchers working abroad
- Public profiles: Master and PhD students, postdoctoral researchers, group leaders, scientific staff
- Private sector profiles: staff departments of innovation, marketing, production, sales, directors, R&D

100tífiques

Girls and STEAM

- Only 23 women have won a Nobel Prize in physics, chemistry or medicine, compared to 608 men.
- Currently, only 28% of all researchers in the world are women.
- Girls represent only 26% in training related to STEM.
- The causes are as diverse as discrimination, social norms, expectations, ways of teaching, stereotypes. Many causes are deeply rooted in our culture and are invisible.
- There is a lack of role models that do not promote the professional development of girls..
- Professionals in the fields of science and technology are increasingly in demand.
- Girls and women are key people in creating solutions to improve society and generate sustainable and inclusive growth.
- They are part of the population with the most wasted talent and need to be turned into the new generation STEAM.

Descifrar el código: la educación de las niñas y las mujeres en ciencias, tecnología, ingeniería y matemáticas (STEM), <https://unesdoc.unesco.org/ark:/48223/pf0000366649>

#100tífiques

More than 100 female researchers from both public and private entities visit schools in Catalonia
February 11, International Day of Girl and Women in Science



VISIBILITY



RESEARCH



ROLE MODELS

100 tífiques

Organizing entities



FCRI promotes innovation from Science to Industry, encouraging the transfer of knowledge to the productive sector. The aim is to make companies aware of public-private partnerships



The main goal of BIST is to build new scientific collaborations between its centers, thus promoting multidisciplinary projects to push the boundaries of knowledge more and more.

Training and Educational Activities



Generalitat de Catalunya
Departament d'Educació



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Collaborations

Amb el suport de:

Hi participen:



100 tífiles

#100tífiques 2022

Preparation activities for researchers:

- Online training workshops to prepare for school visits
- Videos about non-verbal communication led by Teresa Baró
- Videos about experiences from teachers and researchers
- # 100tífiques meet-up (February 4th) to do networking, learn and reflect on the role of women in science and to promote among interest about science among boys and girls.

#100tífiles 2022

Preparatory activities for schools:

- Teaching guide prepared by Eduscopi
- Video presentation of the activity by the Hypathia crew
- Dissemination material provided by researchers (optional)
- Data collection and impact assessment

Objectives for the February 11 session

- Meet a scientist
- Discover her research
- Break stereotypes
- Sparkle curiosity



Main messages

- You don't have to be special to do science
- Everyone can use scientific reasoning
- Science never ceases to amaze us



We also want to...

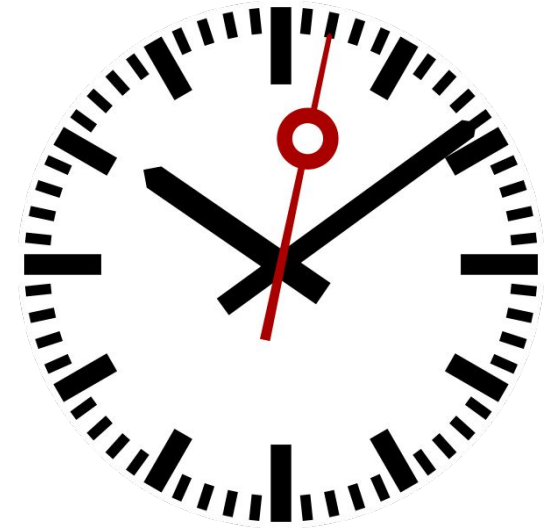
- Show the diversity of the Catalan research ecosystem
- Visualize the research environment of the researchers



Recommendations: timing

1 hour in total

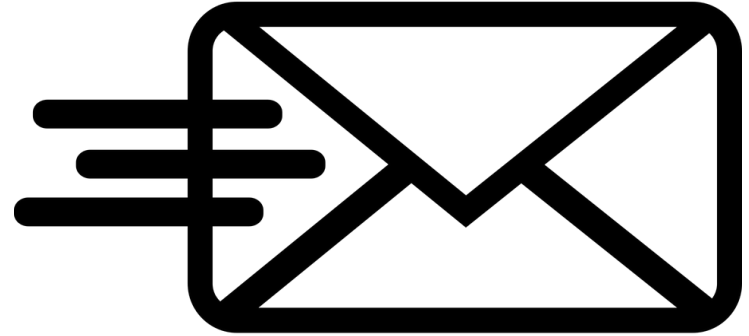
- Connection + icebreaker questions
- 20 min personal presentation
- 20 min research/work presentation
- Last minutes: student's questions



Recommendations

Once you have the details of the assigned teacher. Contact them!

- Go through technical issues
- Ask number of students
- Is it a participatory class?
- Will the research topic be close to them?
- Will they follow the didactic proposal



LET'S START

100 tífiles

Ice breaker questions

- Are you interested in science?
- Would you like to pursue a career in science?

They respond by show of hands. The teacher will count the results.

Impact: At the end of the experiment, they will answer the question again.



LET ME INTRODUCE MYSELF

100 tífiques

Introducing ourselves

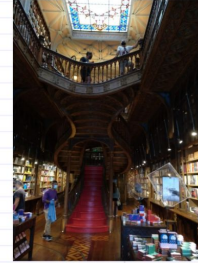
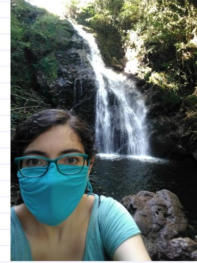
Breaking stereotypes about people in science

- We recommend posting photos or videos
- But introduce yourself looking at the camera

Hobbies and free time

Aficions i temps lliure

Recomanem posar fotos o videos



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Aficions i temps lliure



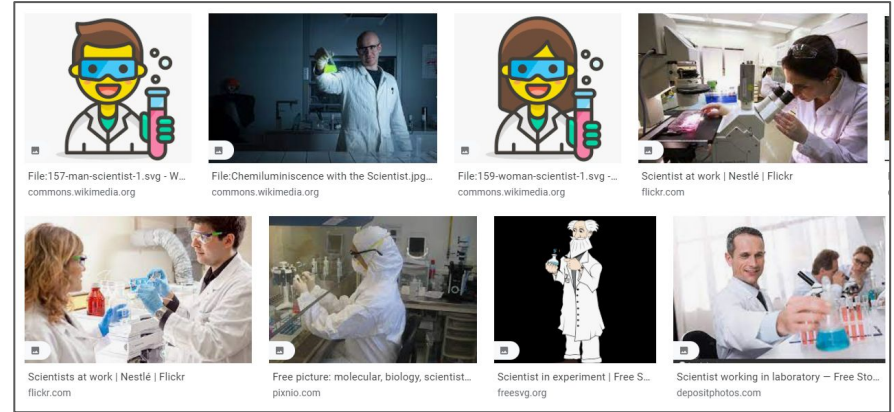
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Introducing ourselves

Breaking stereotypes about people in science

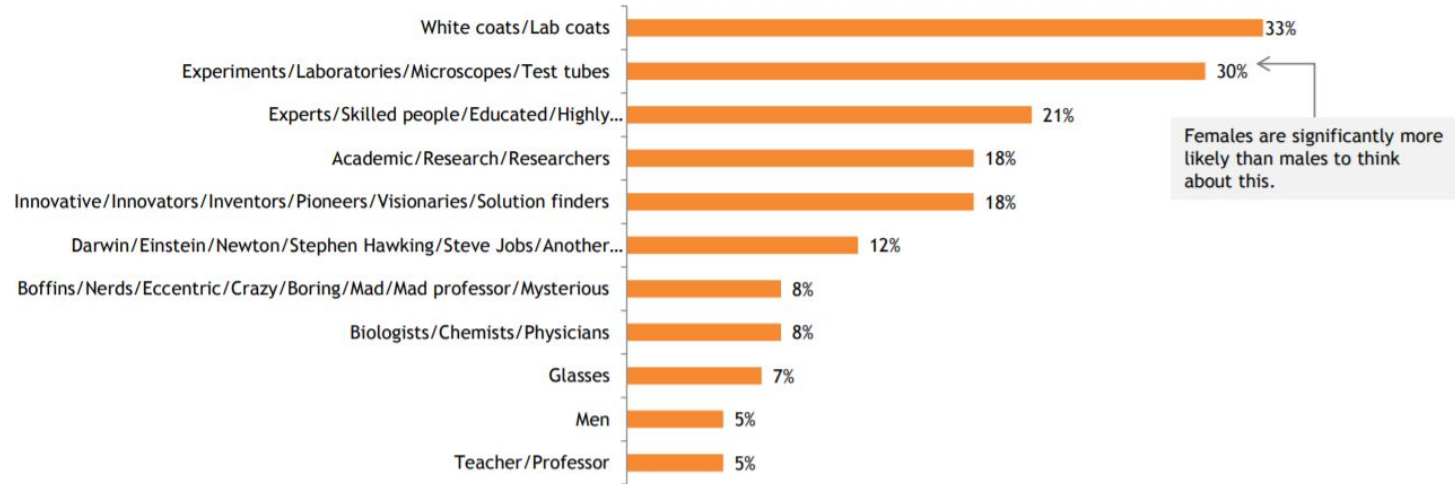
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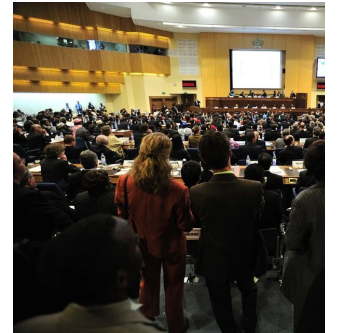
Introducing ourselves

When you think about “scientists”, what comes into your mind?



[Online poll. UK. Students 14-16 years. 2010](#)

De-laboratize



100 tífiques

Speaking of stereotypes...

Draw-a-Scientist Test



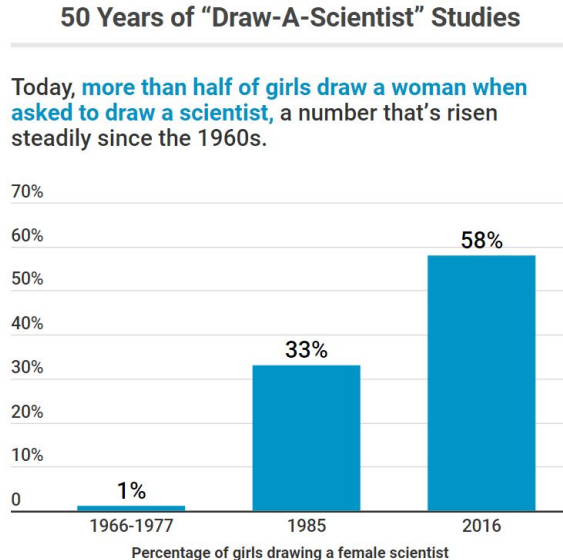
Image Wikimedia ([Yewhoenter](#))

50 years ago (1966-1977) - almost 5,000 boys and girls (50%) aged 5-11 in Canada.

- 28 students drew a female scientist (0.6%)
- No boy drew a woman

Parlant d'estereotips...

Draw-a-Scientist Test (meta-analysis)



50 years later - 80 studies - 20,000 boys and girls.

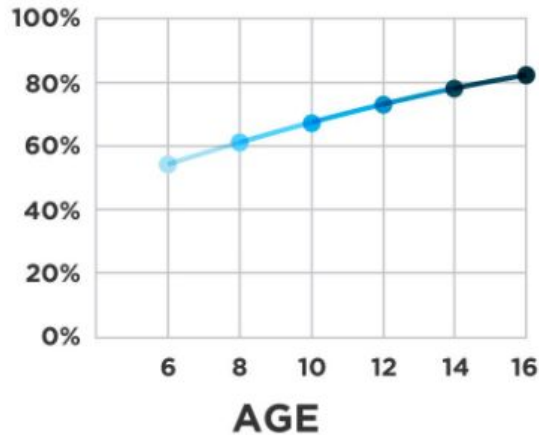
- More than half of the girls draw a woman
- 28% of total responses
- 9 out of 10 times boys drew a man

[50 Years of Children Drawing Scientists - Edutopia](#)

Parlant d'estereotips...

Draw-a-Scientist Test (meta-analysis)

Percentage of students who draw a male scientist



They are more likely to draw a man as they get older.

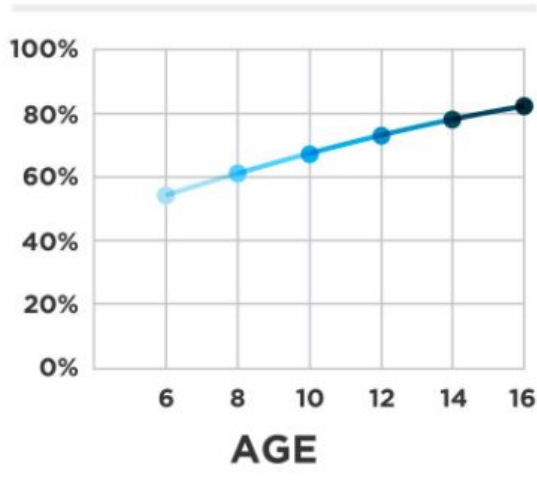
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Speaking of stereotypes...

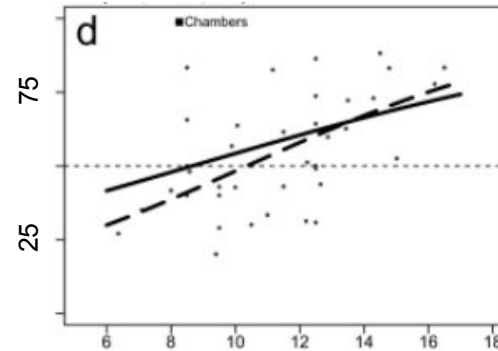
Draw-a-Scientist Test (meta-analysis)

Percentage of students who draw a male scientist



They are more likely to draw a man as they get older.

The biggest change is in girls.



[50 Years of Children Drawing Scientists - Edutopia](#)

100 tífiques

When I was your age...

We get close to their reality

They relate to our experience

Science is not for "geniuses"

Science is an activity for everyone

Quan tenia la vostra edat...

De gran volia ser...

(Millor si podeu posar una foto o un video)



Jocs i aficions...

(Millor si podeu posar una foto o un video)



#100tífiques

Quan tenia la vostra edat...

Magradava...

- ... la ciència? ✓
- ... les mates? ✗
- ... les llengües? ✓
- ... llegir? ✓
- ... la gimnàstica? ✗
- ... l'art i la plàstica? ✗
- ... música? ✓✓✓✓



(Teniu les icones fora de la diapositiva)

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Scientific career

Our relationship with science:

- What sparked your interest in science?
- Were there any scientists in your family?
- Do you admire any female scientists?

Am I happy to have chosen a scientific career?

Carrera científica

Família científica?

Que et va fer interessar-te per la ciència?

No



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Estic contenta d'haver triat la carrera científica?

Sí

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Scientific career

Our relationship with science:

- What sparked your interest in science?
- Were there any scientists in your family?
- Do you admire any female scientists?



Émilie du Chatelet





Katalin Karikó - Imatge Wikimedia (Krdobyns)

How do I work?

Who do I work with?

- Lab mates
- Scientists from other countries
- Technicians
- Administrative/ves
- Scientific communicators
- Students



Com treballo?	
Porto ulleres?	On treballo?
Porto bata?	
Porto guants?	
	
#100tífiques	

Why do we talk about this?

- Do I always wear glasses? Coat? Gloves?
- Post a photo of the lab
- Post a group photo
- Talk about what each person does

Targets:

- Science is collective
- You can do different things

Com treballo?	
Porto ulleres?	On treballo?
Porto bata?	
Porto guants?	
	
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100 tífiques

TECHNICAL RECOMMENDATIONS

100 técnicas

Technical advice

Camera position

Distance to camera

Look at the camera occasionally

Frame: «significant» background

Light

Microphone

Background noise

Face mask (?)



Exposition advice

Text with reasonable size

Don't share your screen all the time

Non verbal language. Move your arms, for example

Slide passer?

Avoid monotonous tone

Have fun so that they also have fun. Convey passion



EXPLAINING OUR RESEARCH

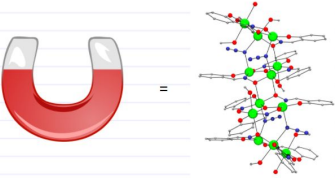
100 tífiques

What's my research about?

- My research / My work
- Not too much text
- Simple images
- Do not use complicated graphs or formulas

Què investigo?

El meu camp és el magnetisme molecular.



Vull sintetitzar molècules que es comportin com imants.

#100tífiques

First of all...

Communication 101

- *Core message* → Your research (at least in this part of the speech)
- *Target audience* → Teenagers

Student's perception of science

Science is...

Exciting

Useless

Complicated

Easy

Surprising

Useful

Boring

Creative

Fun

[Vote](#)

[See results](#)

100tífiles

Student's perception of science



516 respostes

100 tífiles

What to explain?

You and your research

- What?
- Where?
- Who? With whom?
- When?
- How?
- Why?

What to explain?

You and your research

- What?
- Where?
- **Who? With whom?**
- When?
- How?
- **Why?**

What to explain?

You and your research

- What?
- Where?
- **Who? With whom?**
- When?
- How?
- **Why?**



What if I don't research? Explain your work!

Objective: To make visible all types of professions related to science.

What we do in the shadows...

You and your research

- What?
- Where?
- **Who? With whom?**
- When?
- How?
- **Why?**

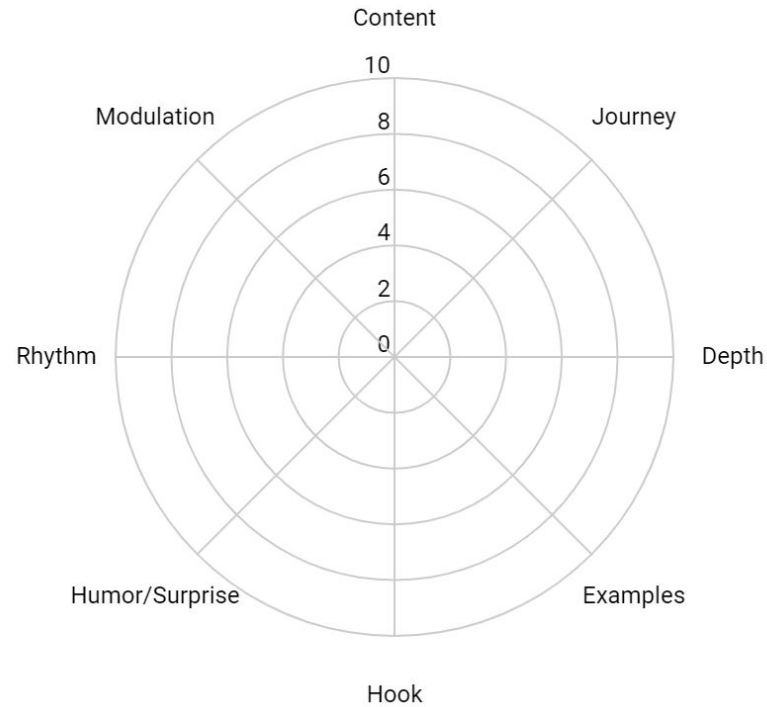
Hidden messages

What we say without noticing...

- **Science and scientists social perception**
- **Gender roles**
- Language education
- Visual education
- Intellectual property
- ...

No pressure whatsoever.

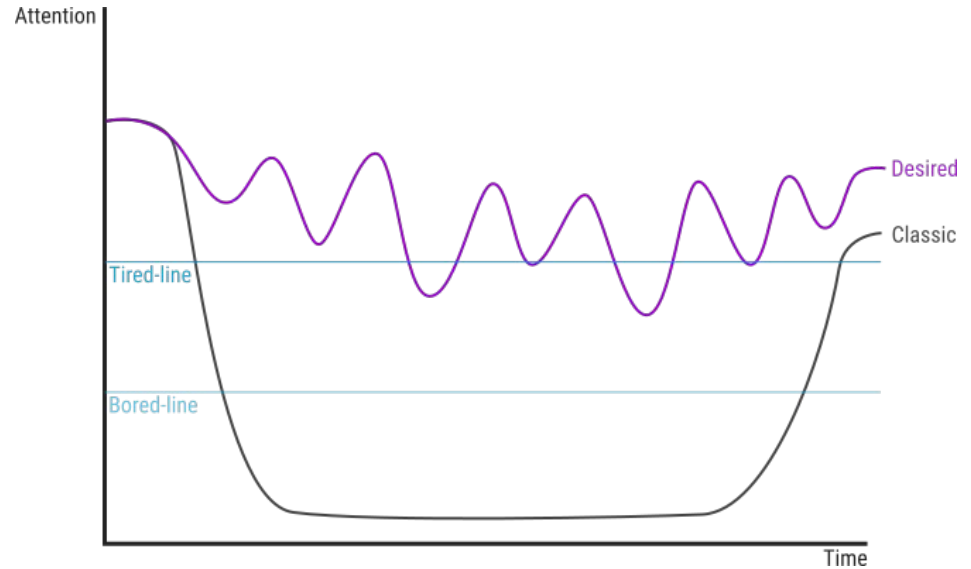
Key elements



100 tífiques

Tools: Attention curve

- Presentation divided in recognizable parts with summaries at the end
- Surprise, comedy (You don't need a joke)
- Voice modulation



From [How to Give Successful Oral Presentations](#).

Scientificleaders.com

100 tifiques

What to explain?

«Tools»



***100* técnicas**

Tools: Scissors

Reduce to the essence

- What is really the main message?
- What do they need in order to understand it?

Put yourself in your audience's shoes



Rainbows - Walter Lewin

Microwaves
explained in
9.99999 seconds

100 tífiques

Tools: Scissors

Once you've reduced to the essence...

You can start building your narrative.



Microwaves
explained in
9.9999 seconds

100 tífiques

Exercise

2' Write a short sentence about your work



100 tífiques

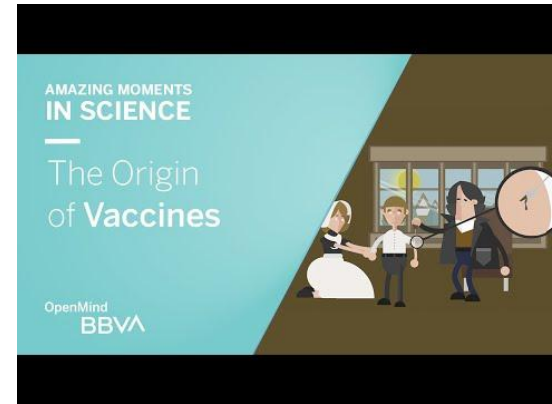
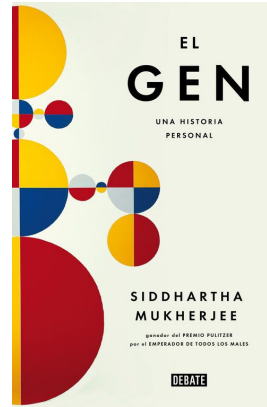
Tools: Stories and emotions

Is there a personal story about how we ended up in this research?

Is it possible to make an emotional bond with our audience?

Tell a story, don't list facts

Can you structure the talk as a story?



100 tífiques

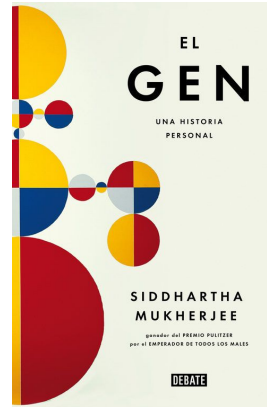
Tools: Stories and emotions

Reinforces the social aspect of science

Fights the «cold» stereotype

Enhances comprehension

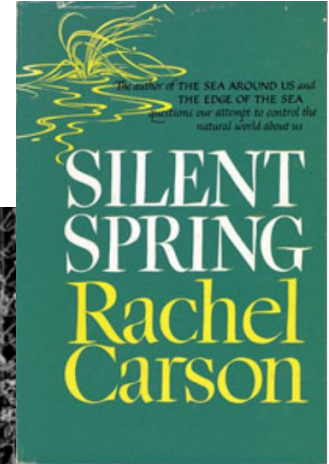
Makes the message more personal



100 tífiques

Tools: Stories and emotions

"There was once a town in the heart of America where all life seemed to live in harmony with its surroundings (...). Then a strange blight crept over the area and everything began to change..."



100 tífiques

Exercise

2' Write ideas for (more or less) emotional stories related to your research



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Tools: What they know

Previous knowledge

- Theoretical (Curricula)
- Real

They are not a *tabula rasa*



[Enseñando ciencia con ciencia - FECYT - Lilly](#)

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Tools: Participation

- Ask questions
- Ask for opinion
- Small quiz
- Small experiment
- Online tools (quizizz, kahoot)



How to manage it (talk to the teacher):

- Raise your hands
- Give the floor

Tools: Language

Adapt your language

- Don't underestimate them
- Don't overestimate them
- Use less tables and graphs (or none at all)
- Mind the slang! Reduce the «sciency-words»



100 tífiques

Exercise

1' Adapt the short sentence to a language for teenagers

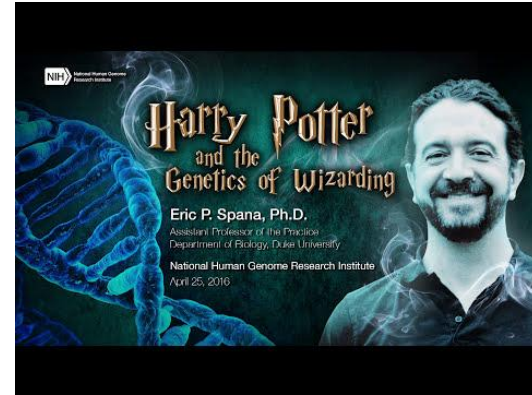
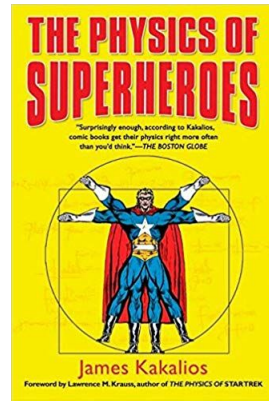
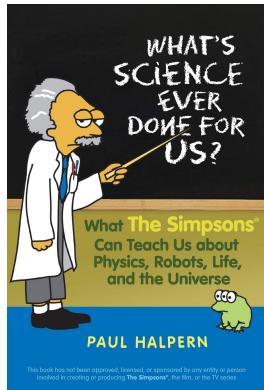


100 tífiques

Tools: Relations

Can I relate my research with...

- Their everyday reality?
- Some well-known applications?
- Pop references? Mind the trends!



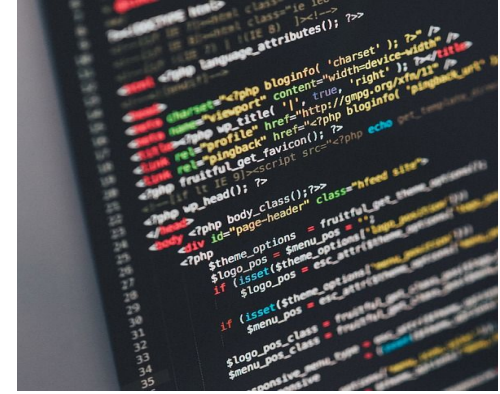
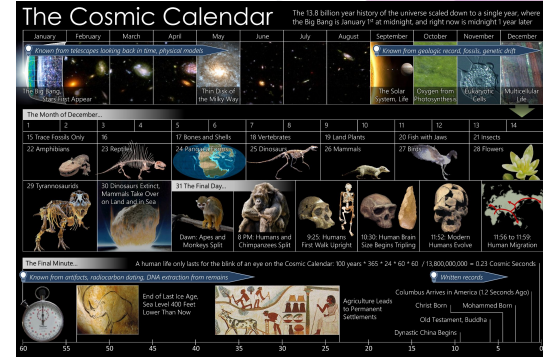
100 tífiles

Comparisons and metaphors

Analyze them well before using them

Robust comparisons

Don't stretch them



Exercici

3' List everyday objects and/or concepts with which you can connect your research.



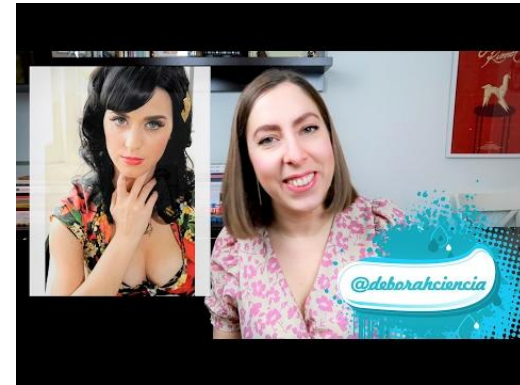
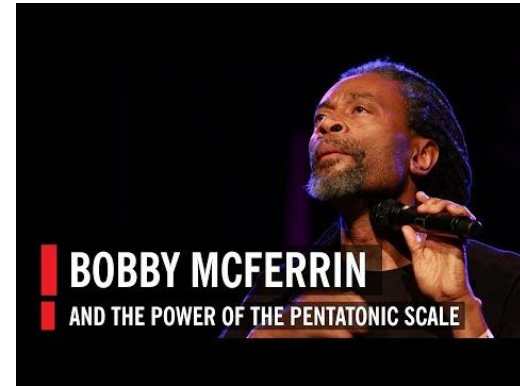
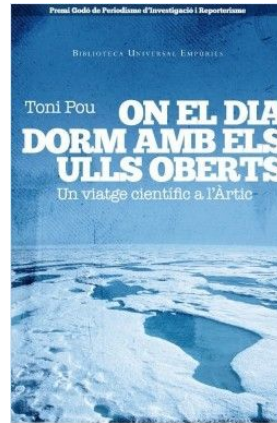
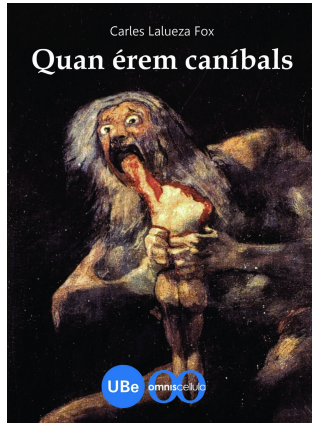
100 tífiques

Tools: Interdisciplinarity

Between branches of science

With other disciplines:

Hybridization



100 tífiles

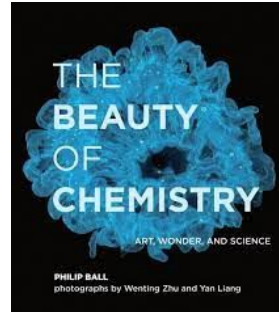
Tools: beauty

Aesthetics

In the wonder of nature, science always adds up, never subtracts.

Double joy: discovery and understanding

The beauty of knowledge and the path that leads to it.



Ode to a flower -

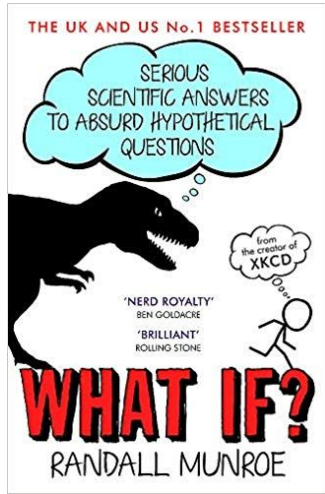


[Feynman i Zorthian: una amistat de tercera cultura](#)

Tools: Surprise

Comedy. You don't need a joke

The humor of the absurd or the unexpected



100 tífiques

Tools: Surprise

Comedy. You don't need a joke

The humor of the absurd or the unexpected

- Comedy
- Surprise
- Voice modulation / enthusiasm
- Body movement
- Participation
- Presentation resources



DIDACTIC PROPOSAL

***100* tífiques**

Science news

- Hypatia Crew
Video

What is the role of the
journalist?



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Before the talk

They'll prepare a chronicle of your visit/talk.

How do you imagine the scientist coming to give the talk?

Find information about the researcher.

Prepare questions.



During the talk

They will work in groups on:

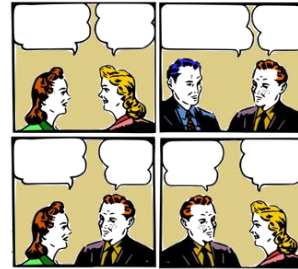
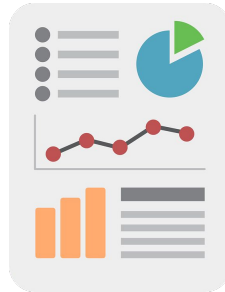
- Scientific profile
- Research field
- Specific research
- Problematic it addresses
- Work environment
- Title of the chronicle
- Graphic documentation
- Questions



After the talk

Chronicle format

- Blog article
- Podcast / radio
- Video
- Infographic or poster
- Comic
- Social Networks



GROUP WORKSHOPS

***100* tífiques**

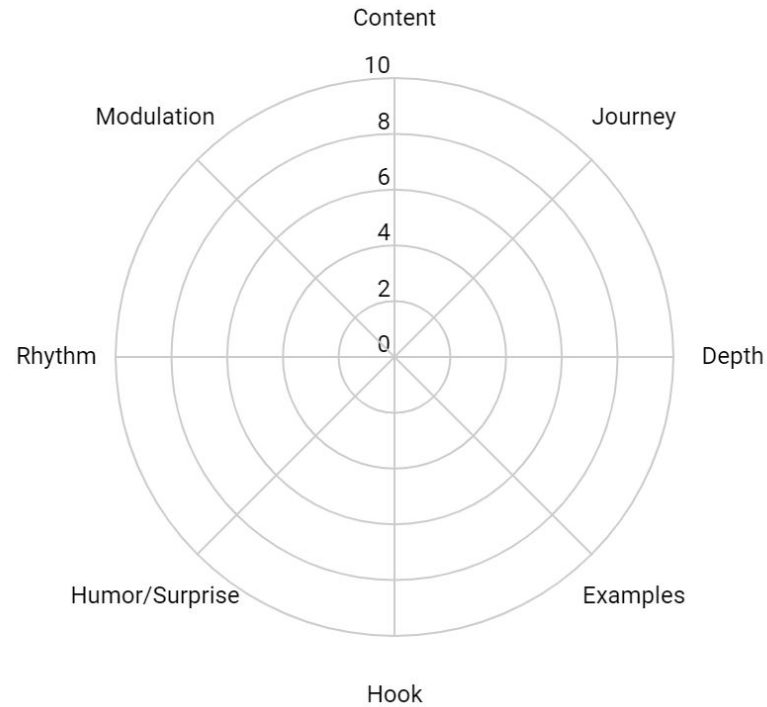
Work in groups

5' Prepare a 5-minute presentation/exposition about your research



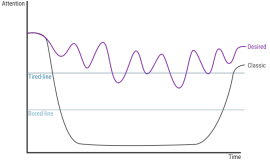

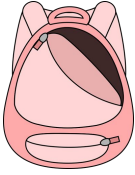


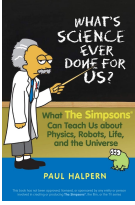




100 tífiques

Key elements



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Tools

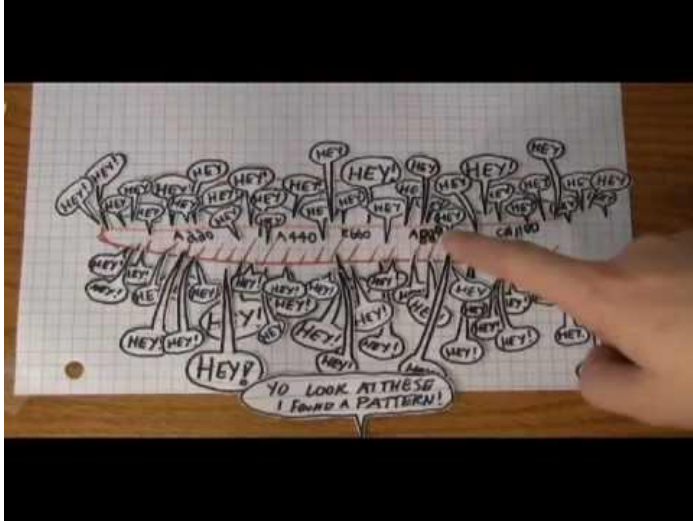
Attention curve	Stories	Previous knowledge	Participation	Language
				
Relations	Comparisons and metaphors	Interdisciplinarity	Beauty	Surprise / Comedy
				

100 tífiques

Group work sessions

- What? (main message)
- Who? With whom?
- Why am I doing this research? Can I tell a story?
- How do I do research?
- What else do I do besides science?
- How can I break gender stereotypes with my talk?
- And the scientific stereotypes?
- Can I relate my research to its immediate reality?
- And with pop culture?
- And with other areas of knowledge? Art?
- Can I use a metaphor?
- How can I surprise them?
- Is there beauty in my search?

Key elements to consider: analysis



- Content
- Journey
- Depth
- Examples
- Hook
- Humor / Surprise
- Rhythm
- Modulation

100 tífiques

Key elements to consider: analysis



- Content
- Journey
- **Depth**
- **Examples**
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100 tífiques

Key elements to consider: analysis

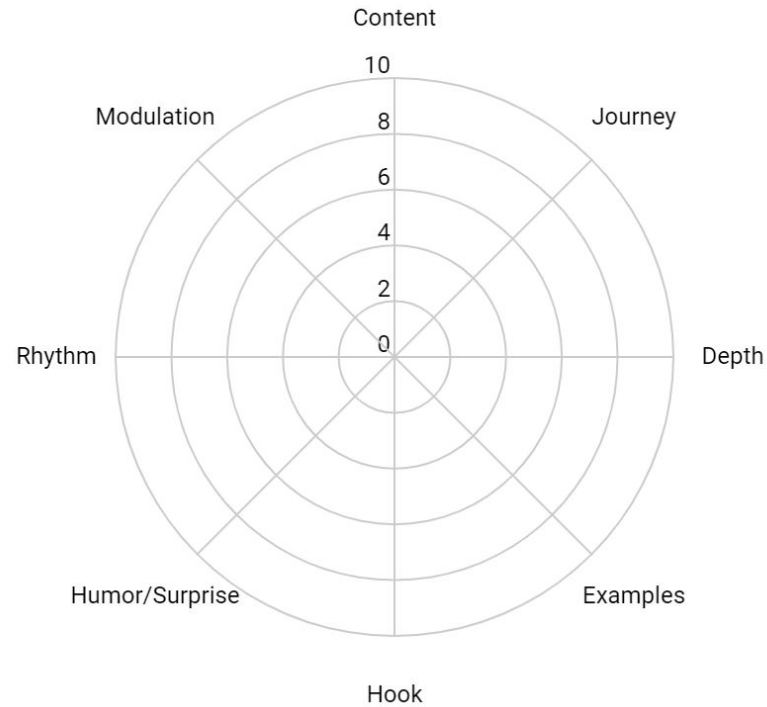
Key elements to consider: analysis

EATING BABIES



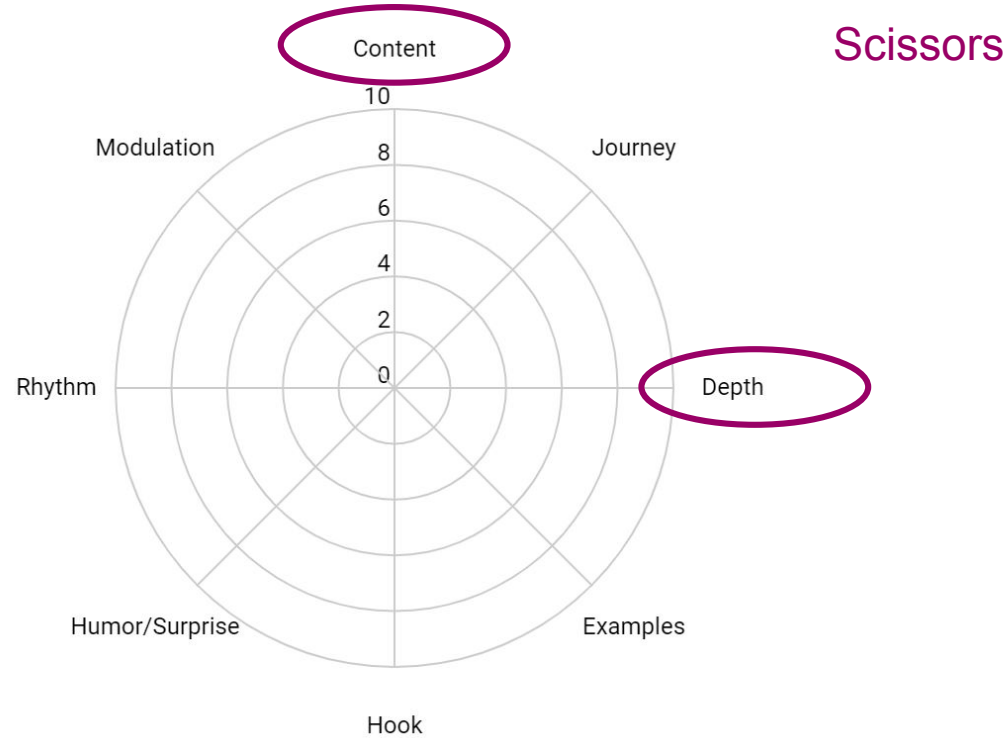
- Content
- Journey
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- Examples
- **Hook**
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Key elements



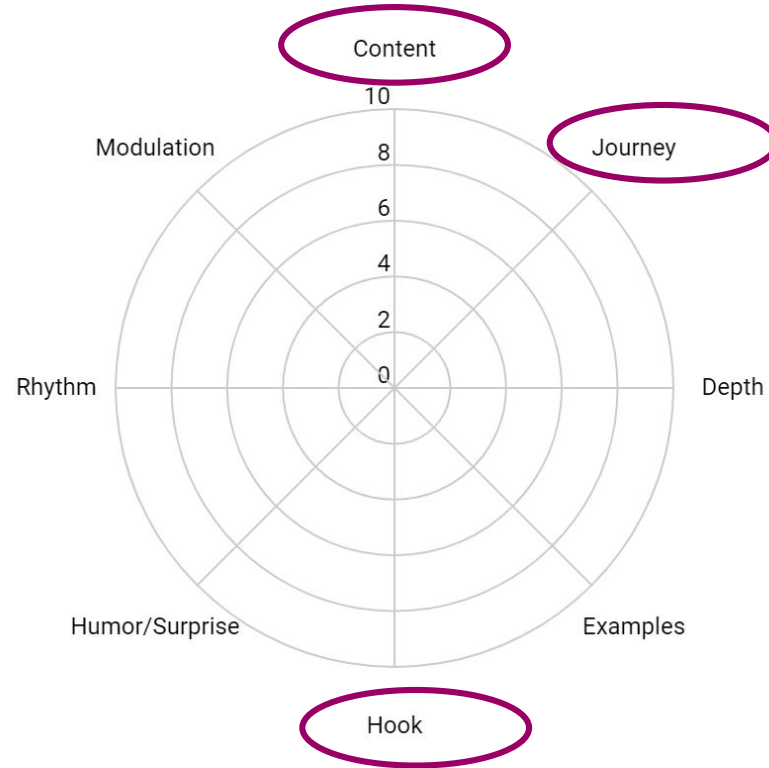
100 tífiques

Key elements



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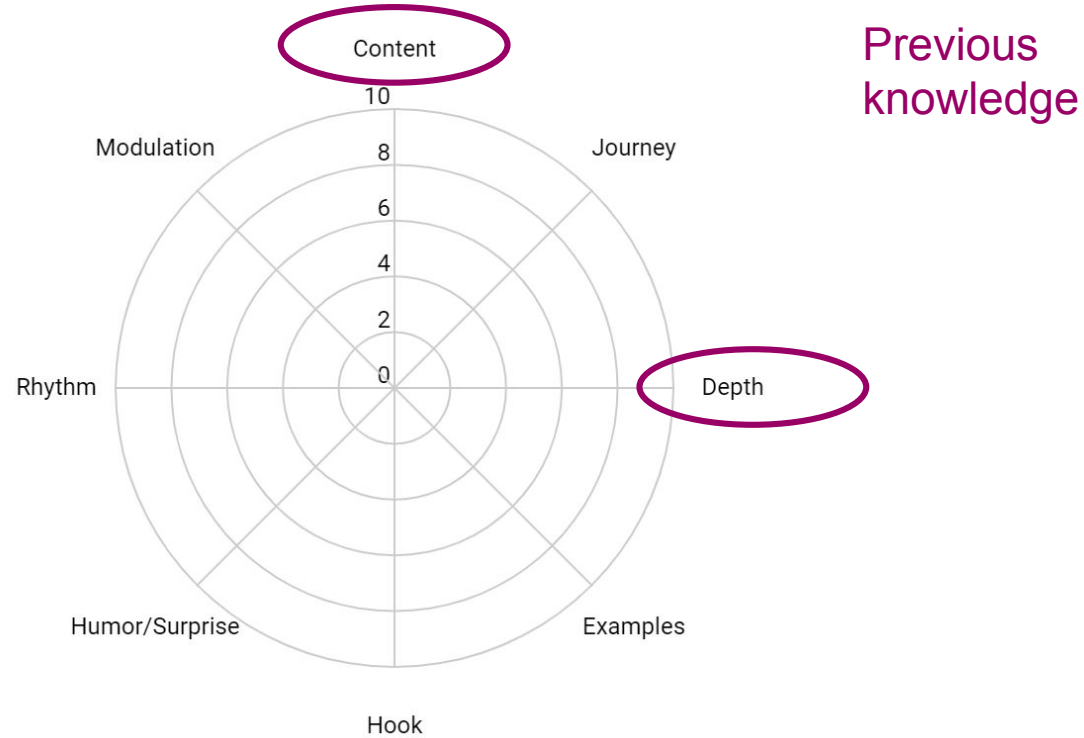
Key elements



Stories

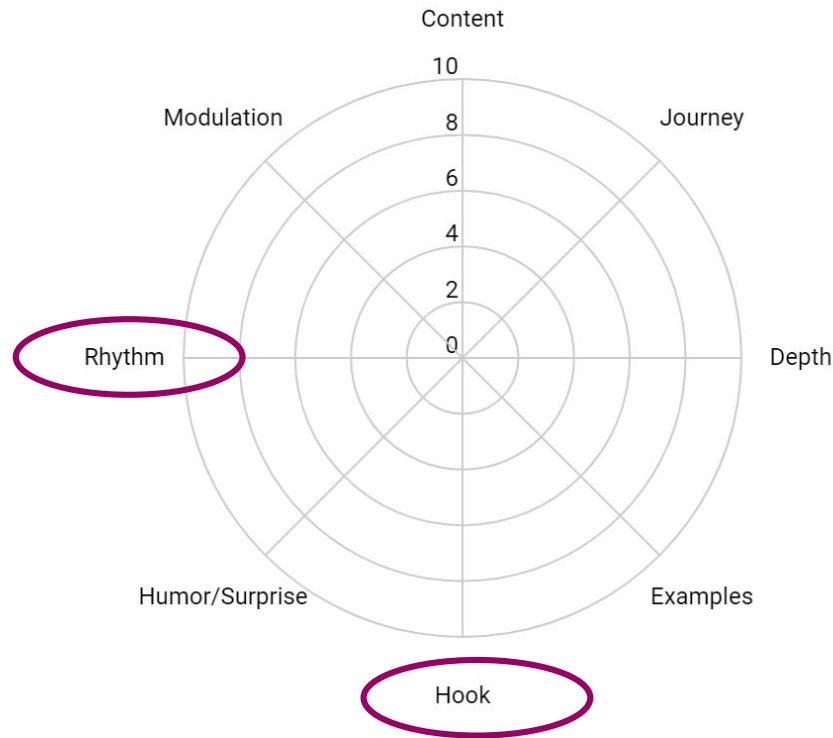
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Key elements



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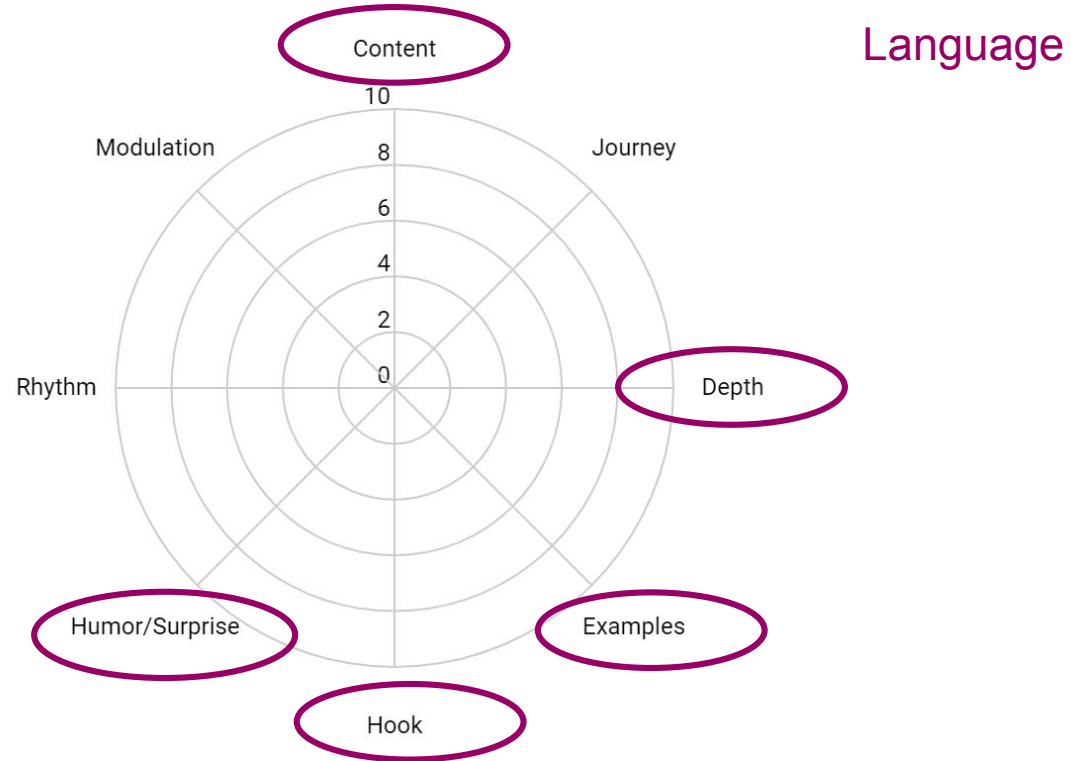
Key elements



Participation

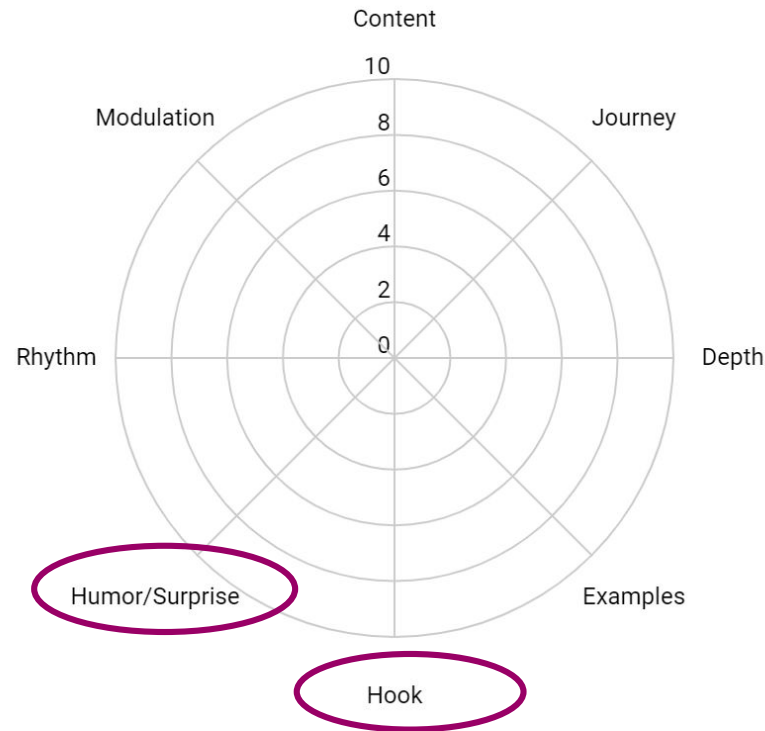
100 tífiques

Key elements



100 tífiques

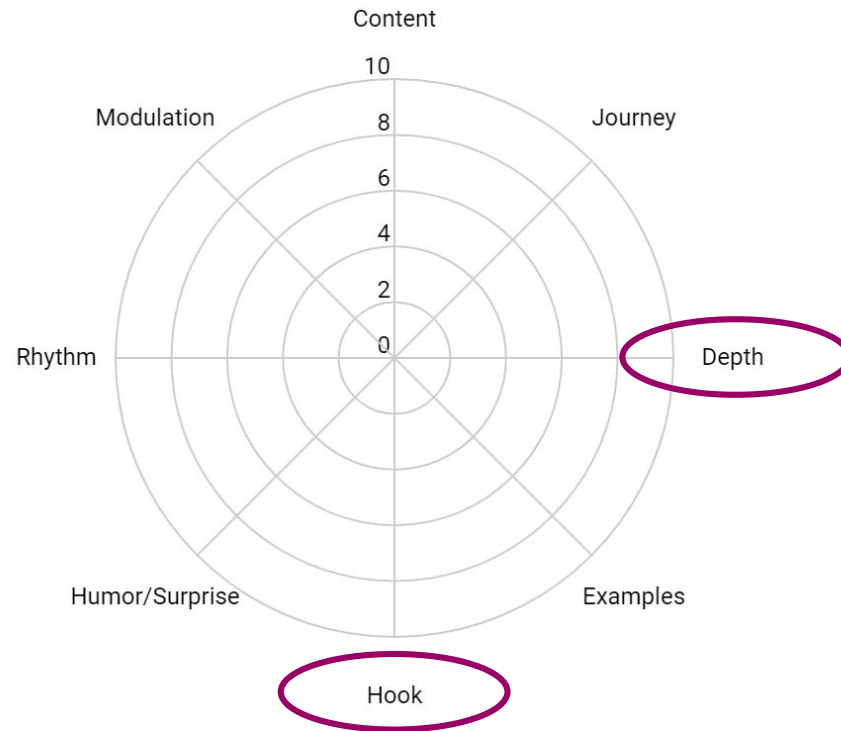
Key elements



Relations

100 tífiques

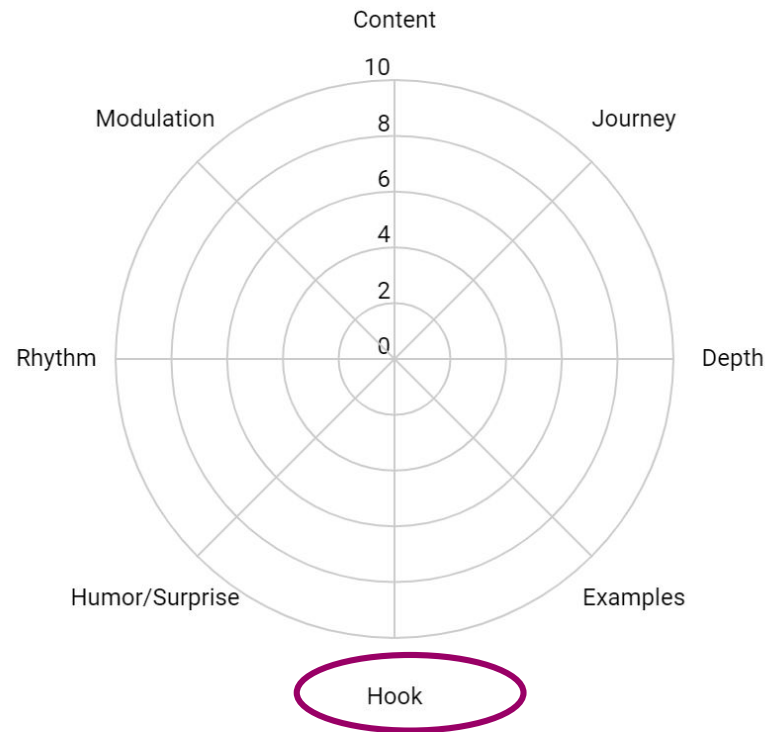
Key elements



Comparissons
and
metaphores

100 tifiques

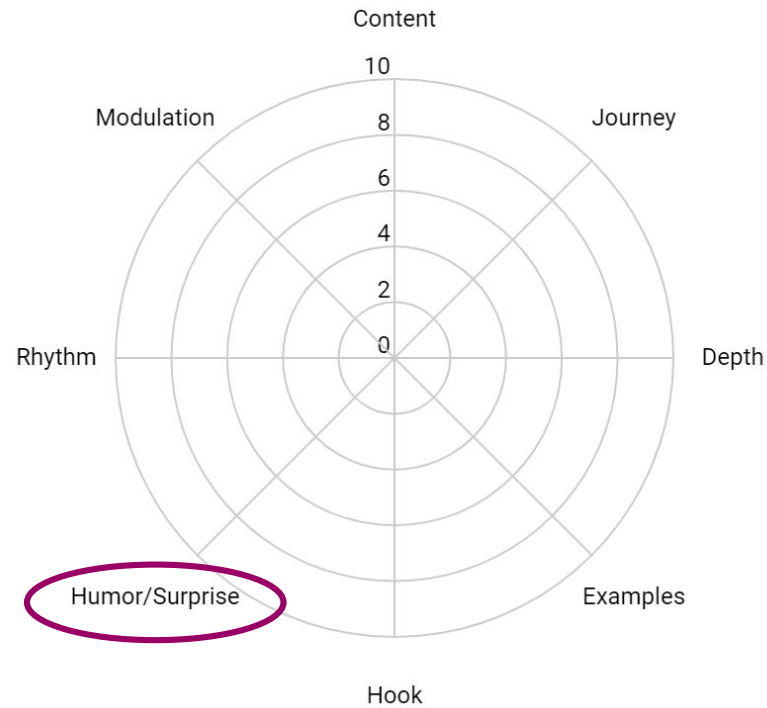
Key elements



Interdisciplinarity
Beauty

100 tífiques

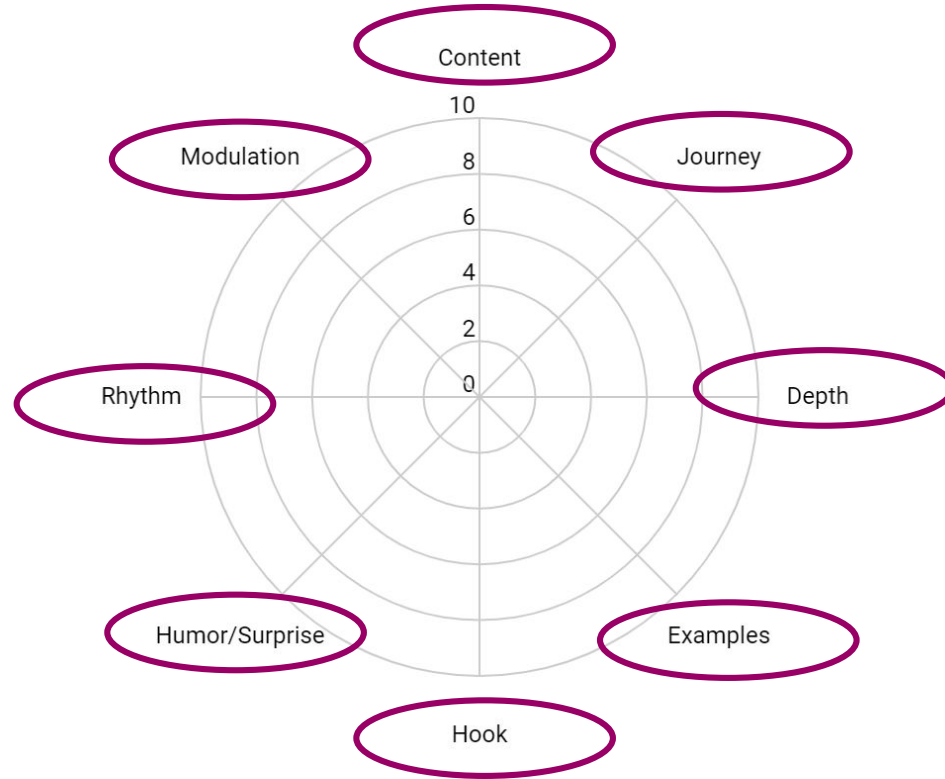
Key elements



Surprise / Humor

100 tífiques

Key elements



Attention curve

100 tífiques